Marefa

bottle filling equipment

DESCRIPTION:	FOREWORD			**PAGE:**	1
MODEL	TF 1/8/F2/S1	**SERIAL NO.:**	080705000246	**YEAR:**	2005
DESCRIPTION: 2-STAGE TUB FILLER					

Dear Customer

Thank you for purchasing a Marefa product. We assure you of our continued after sales service and of safe and efficient operation of our product, which requires the minimum maintenance and spare parts replacement.

Herewith, the operator's manual of the 2-stage tub filler.

Regards

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DESCRIPTION: 2-STAGE TUB FILLER					

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DESCRIPTION:	TECHNICAL DATA			**PAGE:**	4
MODEL	TF 1/8/F2/S1	**SERIAL NO.:**	080705000246	**YEAR:**	2005
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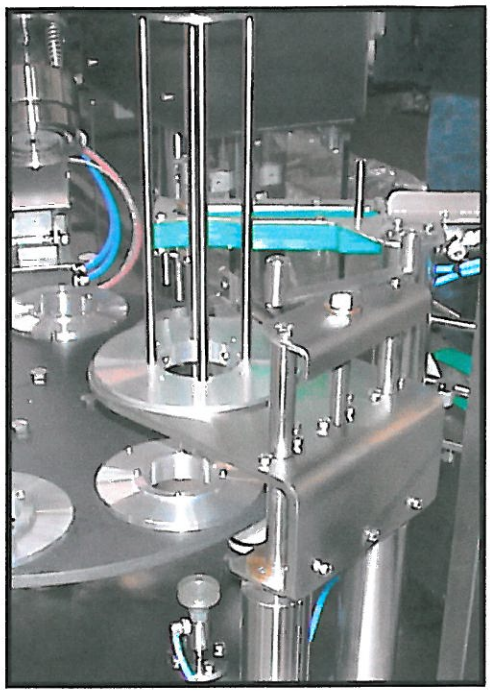
1. Technical Data:

MONOBLOCK	TF1/8/F2/S1
MACHINE DRIVE	SAF57DT80K4 - 0.55Kw, 25 RPM Motor (HOLLOW SHAFT)
ELECTRICAL SUPPLY	380/415 Volts 50Hz 3 Phase with Neutral and Ground
AIR SUPPLY	4-5 Bar at 300L/Min

2. Machine procedure:

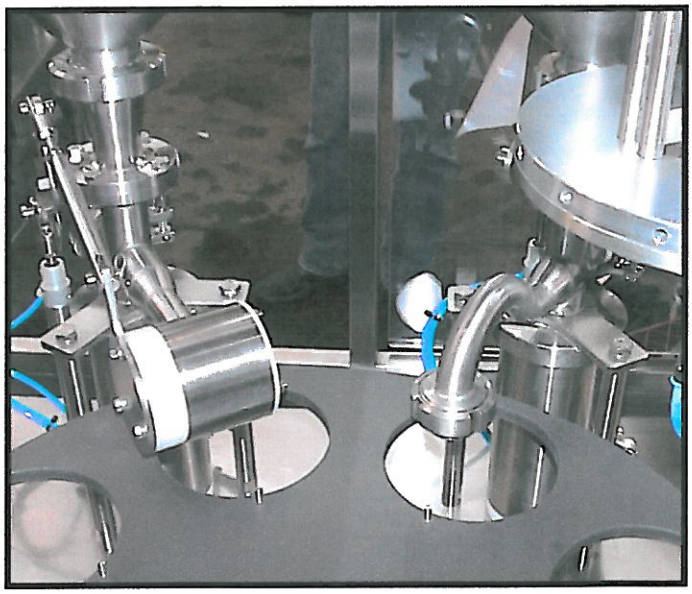
2.1 Cup holder station:



The filling procedure starts at the cup holder station. The main cam turns the carrier table until one docking station aligns with the cup holder. The empty cups are piled up in a chute. The cup sucker arrangement, consisting of a pneumatic cylinder connected to a vacuum generator pulls the cups from the chute and releases it in the inserts. The pneumatics cam and limit switches activate the cup sucker. With the machine come change parts that are made according the specifications of different tub sizes.

The main cam causes the carrier table to rotate further, stopping at the next station. The process now repeats itself for the next docking station.

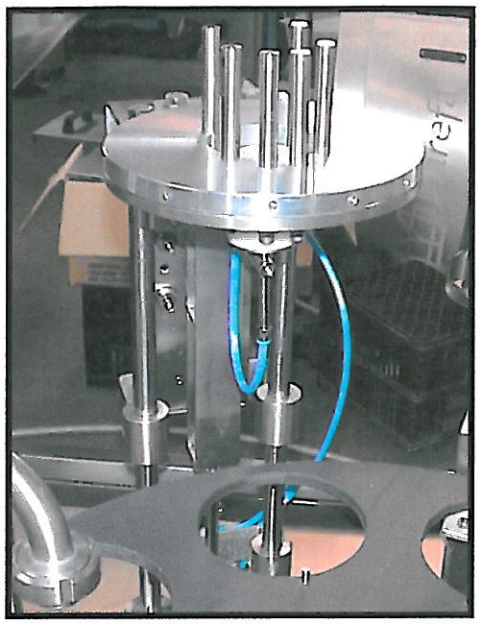
2.2 Filling stations:



The tub filler has two filling stations. Each filling station consists of pump with pneumatic cylinder, which is connected to the filling valve. The product is kept in a reservoir tank, which feeds the filling valve on demand. The valve on the first filling station was designed to fill yoghurt, while the second filling valve is for cream. When the docking station reaches the filling station the 'no cup, no fill' sensor allows filling to proceed and the pneumatic cam activates the cylinder and filling starts. A selector switch shuts off the filling station, which does not take part in the cycle. The docking station will still stop at the inactive filling station but no filling will take place.

2.3 Foil dispensing station:

Next the docking station reaches the foil dispensing station. The foil lids are placed upside down in the foil holder. The foil sucker gets activated by a sensor, and pulls the foil from the holder, using a vacuum generator. The sucker runs on a cam, and while moving down, it turn the foil lid around, and releases it on the filled cup. The cup is now ready to be sealed.



2.4 Sealing station:

The carrier plate rotates again and the docking station arrives at the sealing station. The pneumatics cam activates a cylinder and lowers the sealing unit onto the cup. The sealing unit consists of a sealing iron that is heated by an element. The sealing iron fits on the edges of the cup and melts the foil onto the plastic cup.

2.5 Discharge station:

The filled and sealed cup now approaches the discharge station. At this station the cup gets lifted from the docking station by a pneumatic cylinder. When the bottom of the cup clears the docking station, the cup pusher gets activated and it moves the cup onto the conveyor.

3. General:

Most accidents, which occur during the operation and maintenance of machinery, are the result of failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing any potential hazards.

When handling, operating or carrying out maintenance on the machine, personnel must use safe engineering practices and observe all relevant local health and safety requirements and regulations.

Marefa cannot anticipate every possible circumstance, which might represent a potential hazard. The warnings in this manual are therefore not all-inclusive. He/she must ensure that the machine will not be damaged or made unsafe for other operators when they employs an operating procedure, an item of equipment or a method of working which is not specifically recommended by Marefa.

Failure to observe the precautions given under 'Safety Procedures' may be considered dangerous practice or misuse of the machine.

4. Guide for filler operation:

All electrical connections are to be properly grounded and insulated at installation and in accordance with the local electrical code.

WARNING: NO WORK OR ADJUSTMENTS ARE TO BE MADE WHILE THE MACHINE IS IN MOTION.

Operator Instructions: No person should operate, clean, or work around the filler unless they have been instructed on the location of the machine controls, the proper procedures for stopping and starting and the function of all other controls on the control station.

WARNING: THE MACHINE MUST BE STOPPED EACH TIME AN ADJUSTMENT IS REQUIRED, A BOTTLE IS TO BE REMOVED, PARTS ADDED OR REMOVED AND DURING THE CLEANING AND SANITIZING OPERATION

5. Operational Precautions:

- Only competent personnel under qualified supervisor must operate the machine.
- All risk lies exclusively with the operator. Purposeful operation includes complying with the operating instructions and inspection and maintenance stipulations.
- Never remove or tamper with safety devices, or guards fitted to the machine.
- The machine should only be used in technically sound condition and only for the purpose for which it has been designed and manufactured.
- The machine must only be operated at supply voltages and/or frequency for which it is designed.
- When main power is switched on, lethal voltages are present in the electrical circuit, and extreme caution must be exercised whenever it is necessary to carry out any work on the electrical system.
- Do not touch electrical components while voltage is applied unless it is necessary for measurements, tests or adjustments. Only a qualified electrician equipped with the proper tools and wearing the appropriate body protection against electrical hazards should carry out such work.
- It is the duty of the operator to inform the person responsible for that department, of any alterations, which have taken place on the machine, which may reduce the safety factor.
- The machine should be checked for visible damage and defects at least once a day. Any changes (including the operating performance) should be reported at once to the person responsible for that department.
- The electrical wiring should be inspected and checked regularly. Defects such as loose or charred cables must be repaired.

6. Points of Caution:

- **Carrier table assembly:** The tubs are secured in the carrier plate while moving through the machines. The filler must be stopped before retrieving any objects from the base or anywhere near the rotating table.

- **Do not use the filler base, platform assemblies or conveyor as a step:** The base is highly polished making it extremely slippery when wet. A step stool or stepladder must be provided when it is necessary to assemble, disassemble, or adjust components on top or inside of the filler.

- **Do not clean while in motion:** No attempt should be made to clean or remove objects from the filler base while it is in motion. The base was designed to be cleaned with steam, water or a long handled brush.

7. Maintenance Precautions:

- Only competent personnel under qualified supervision may carry out maintenance and/or repairs.
- If replacement parts are needed, use only original Marefa parts.
- Before removing any safety guarding or dismantling any part of the machine, carry out the following preparatory operations:
    - Isolate the machine from the main electrical supply. Lock the isolator in the 'OFF' position.
    - Attach a label to the isolator switch and display panel carrying the warning 'WORK IN PROGRESS – DO NOT APPLY VOLTAGES'.
    - Do not switch on electrical power or attempt to start the machine if a warning label is attached.
    - Detach the air connection pipe on the machine.
- Use only lubricating oils and grease approved by Marefa. Make sure that the selected lubrication complies with all the relevant safety regulations, especially with regard to the risk of contamination and health.
- Always clean up oil spills from the surrounding floor and outside of the machine before and after maintenance work. Make sure that all instructions concerning operation and maintenance are strictly followed and that the complete machine, with all accessories and safety device is kept in good running order.
- Protect the motor, electrical and regulation components against moisture e.g. when steam cleaning.
- After completion of repairs and maintenance, ensure that no tools or loose items are left on or inside any part of the machine.
- Check the rotation of motor when starting up the machine initially and after any work done on the electrical connections or switchgear.

- Precautions must be taken when using acids, alkalis and chemical detergents for cleaning machine parts and components. These materials cause irritation to the skin, eyes, nose and throat. Avoid splashes and wear suitable protective clothing and goggles. Do not breathe mist. Ensure that water and soap are readily available.

- Keep the operating instructions nearby at all times.

8. Critical sensors:

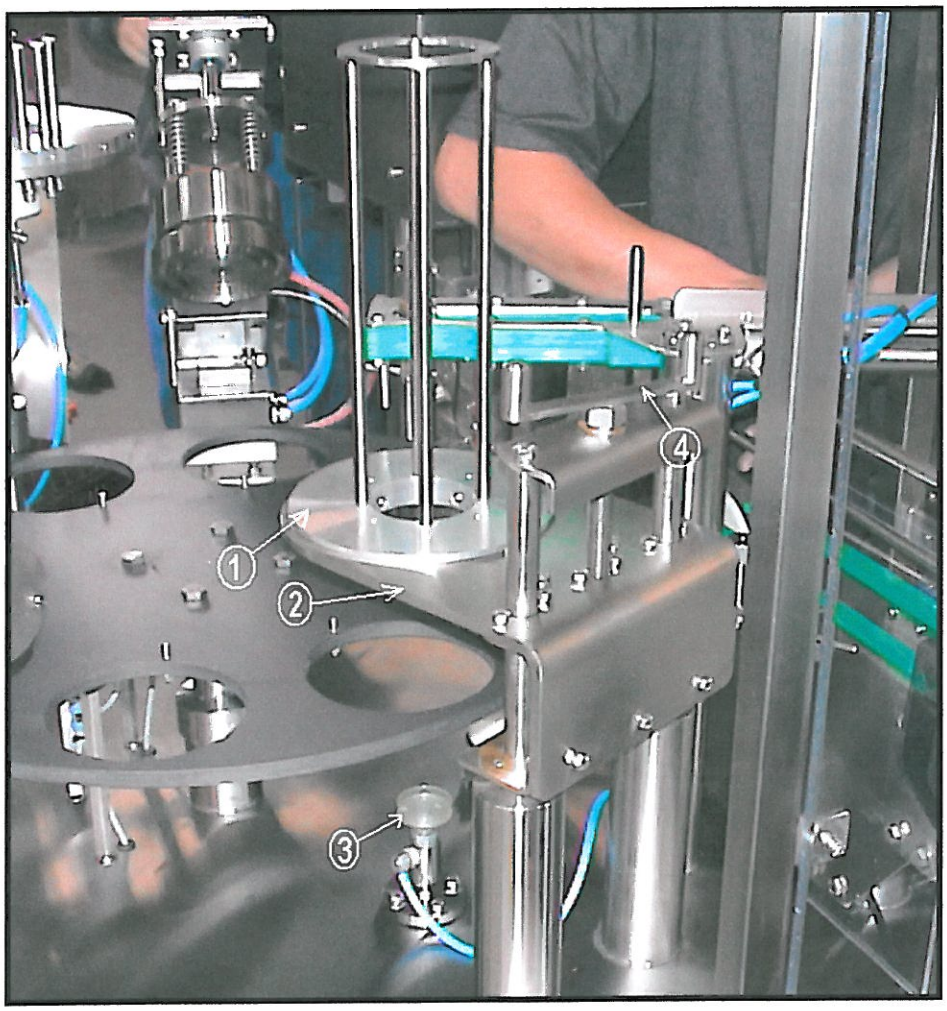
Underneath the carrier table, pointing at each station is an electronic sensor that is connected to the pneumatics system. The sensor picks up the cups as they arrive at each station. If for some or other reason, one of the docking stations is empty, the sensor would realize there is no cup, and the empty docking station will just pass that station. This ensures that no yoghurt or foil will be spoiled, and the machine will stay clean. Although an empty station will go through a full rotation, without any of the stations functioning as it comes by, the rest of the docking stations will be filled and sealed as normal.

9. Adjustments & Set-ups:

9.1 Tub holder station:

For different tub sizes there are different cup holders. Cups with volume of 100ml – 250ml uses the same cup holder. The cup holder that will be used gets mounted on the jacking plate.

Because of the difference in sizes of the cups, the distance that the cup sucker will have to move to pull down the cup will vary.
To compensate for this, the height of the cup holder should be adjusted by turning the jacking lever.

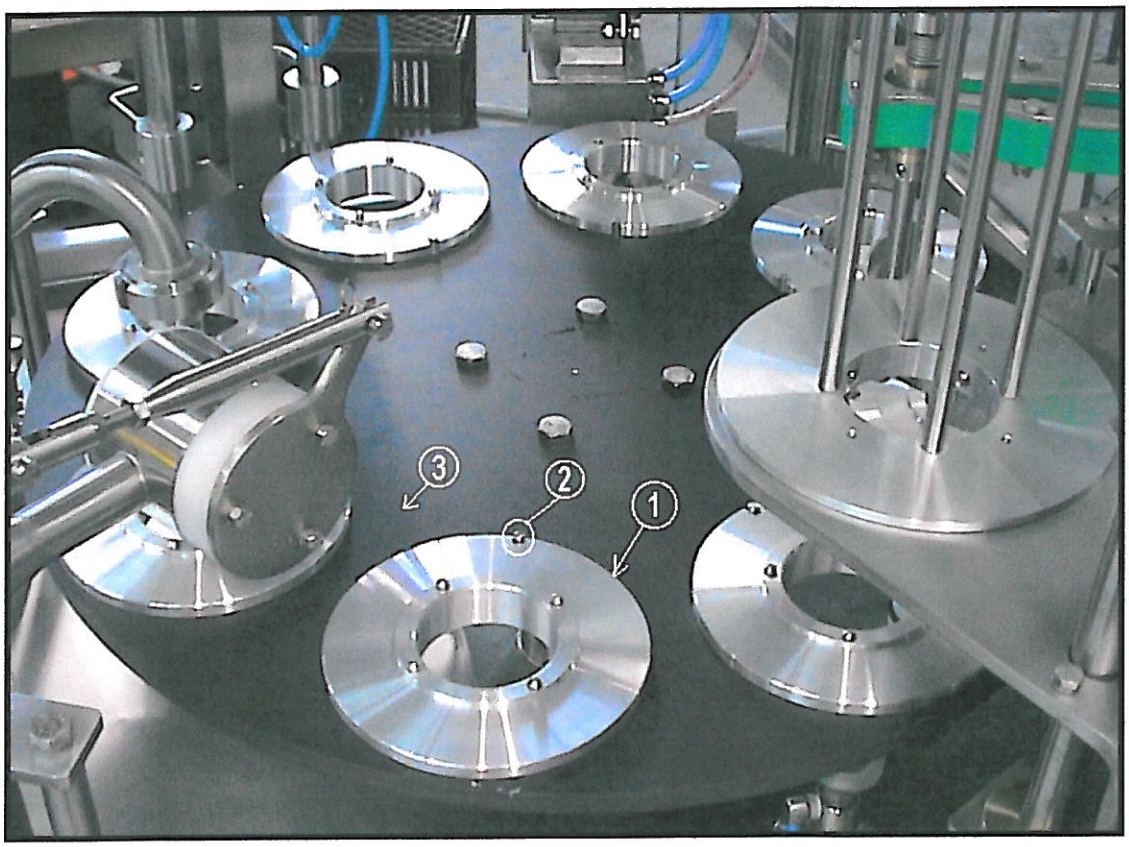


1. Cup holder
2. Jacking plate
3. Cup sucker
4. Jacking lever

9.2 Tub inserts:

For each different tub size, an insert ring is made. The tub fits accurately in the insert ring. The tub inserts are placed in pockets in the carrier plate. A locating pin in the carrier table acts as an anti rotate, and ensures that the inserts is aligned properly.

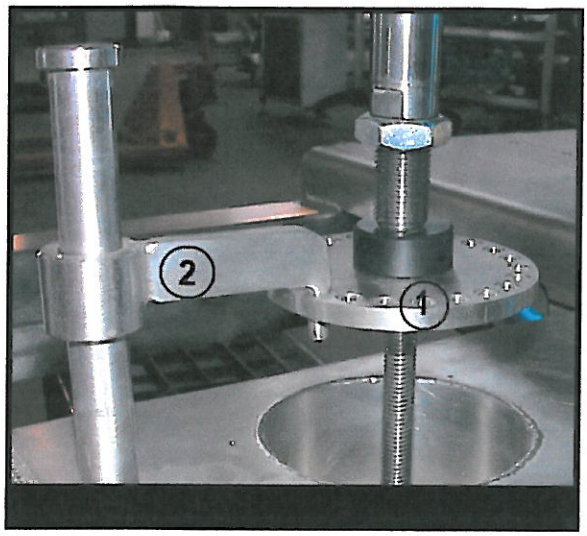
Note: Ensure that the correct inserts are in place for the tub that is to be filled.



1. Cup inserts
2. Locating pin
3. Carrier plate

9.3 Filling:

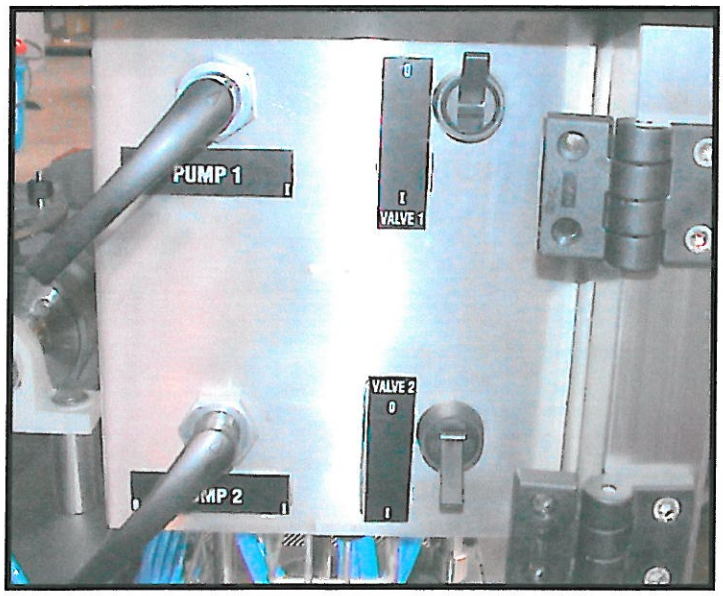
To accommodate for different tub sizes, the filling volume is adjustable. This is done by changing the stroke length of the pump. The stroke setter is situated underneath the filling stations.



To adjust the volume, dislocate the stroke setter pin so that the stroke setter disc rotate. Turn the stroke setter plate clockwise to increase volume, and anti-clockwise to decrease volume.
When finished, locate the stroke setter pin to lock the disc.

1. Stroke setter plate.
2. Stroke setter pin.

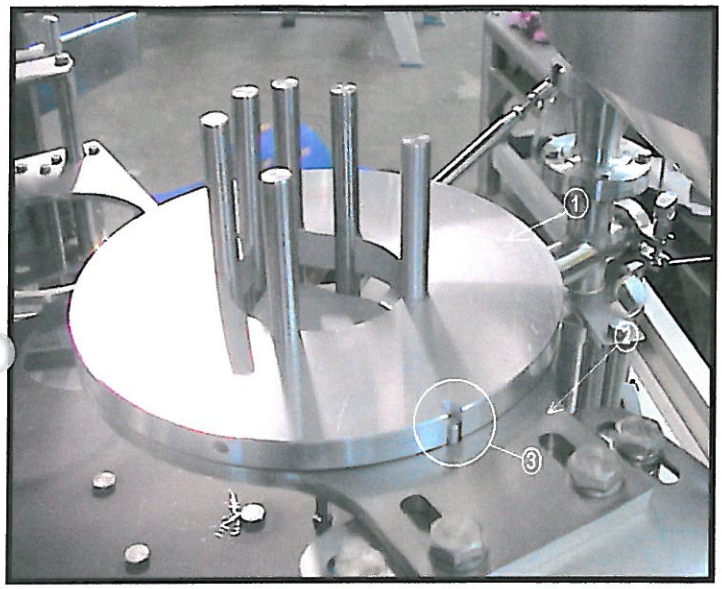
Selecting a filling station:



As mentioned, the first filling station was designed to fill yoghurt, and the second filling station for cream. Before the process can start, a filling station must be selected. The selector switches for the pumps and filling valves are situated on the selector board behind the side panel. To select, switch the filling valve and pump of the desired filling station on.

Note: Make sure that the pump and the filling valve of the inactive filling station are switched of before starting the machine.

9.4 Foil dispenser:



The only adjustment necessary at the foil dispenser station is to change the foil insert ring.

The foil inserts are made according to the size of the foil, and fits into the pocket in the foil dispenser station. A pin in the insert pocket fits into the pocket in the insert ring to ensure proper alignment.

No matter the size, the height of the tubs stays constant when secured in the inserts; therefore no height adjustment of the foil dispenser is necessary.

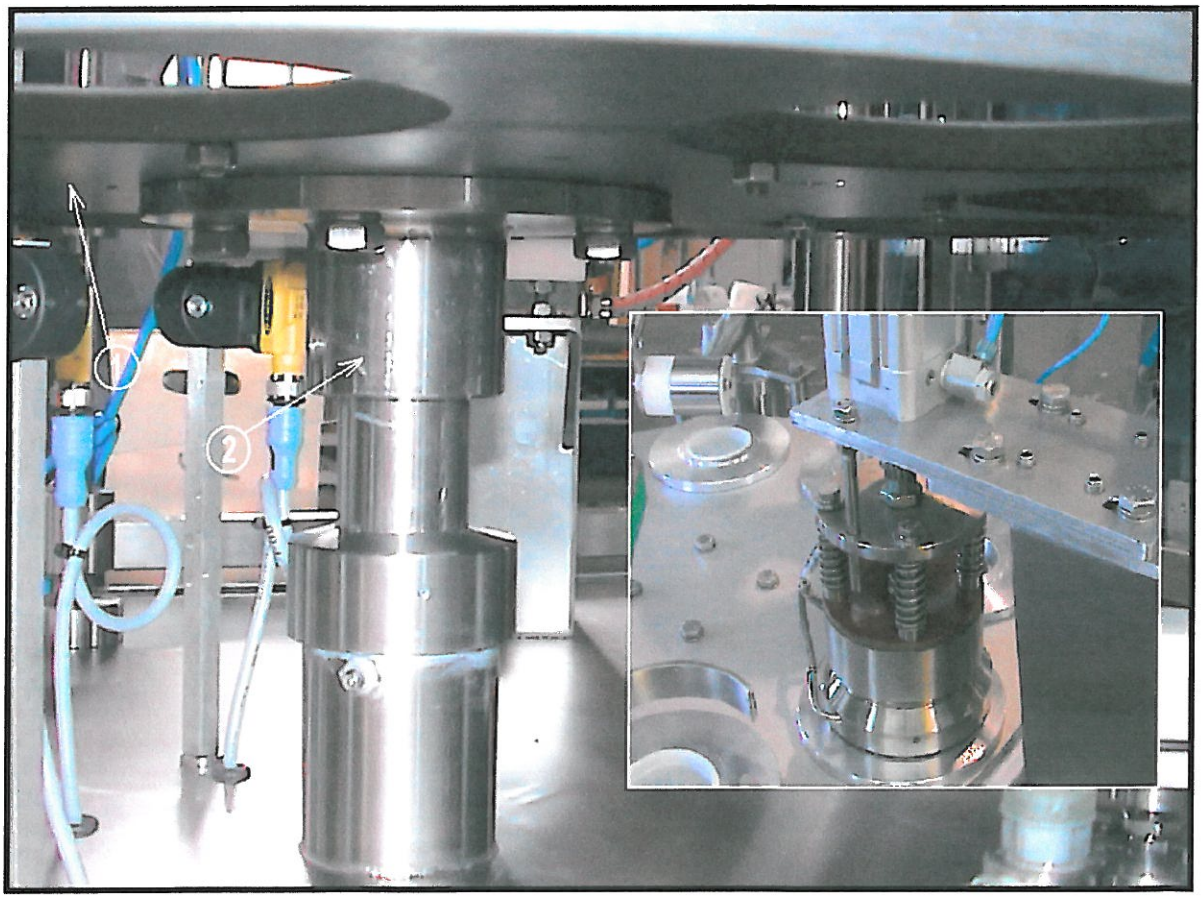
1. Foil insert ring
2. Insert pocket

9.5 Timing setting:

It is extremely important that the timing of the machine is set accurately.
If not the machine would not function properly and might cause damage.

The most accurate way to set the timing would be to align the carrier table with the heat sealer.
To set the timing, loosen the bolts lock the table boss with the drive shaft.
Turn the table until one of the docking stations aligns with the heat sealer.
When finished remember to fasten the bolts.

The timing is now set, and the machine will function according to design.



1. Carrier table
2. Table boss

10. Start-up procedure:

- The sealing element needs time to heat up. To ensure that the sealing unit is warm enough to seal the cups properly, it should be switched on at least 30 minutes before production starts.
- Mount the correct cup holder for the size cups that will be filled. Cups, with volume 100ml to 250ml use the same cup holder.
- Make sure that the correct size cup inserts are placed in the carrier plate.
- Adjust the height of the cup holder station so that the cup sucker neatly pulls the cup from the holder.
- Select the correct filling station.
- Ensure that the filling volume of the filling valves is set according to the cup size. If not adjust by turning the stroke setter plate.
- Fit the correct foil insert ring.

11. Maintenance applications:

11.1 CIP (Cleaning in Progress):

- Switch the selector switch on the panel to CIP.
- Connect the CIP pumps.
- Start the machine.
- Switch off the pump valve.
- Switch on the fill valve.
- Start the CIP pump.
- Run for ±10 minutes.
- Switch CIP off.
- Adjust stroke setter to bottom.
- Switch pump- and fill valves off.
- Run for ± 10 minutes.

11.2 Lubrication:

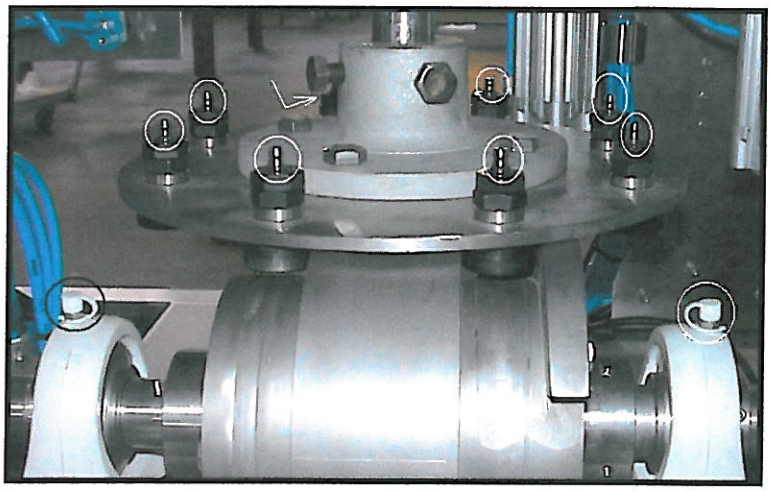


Fig.1

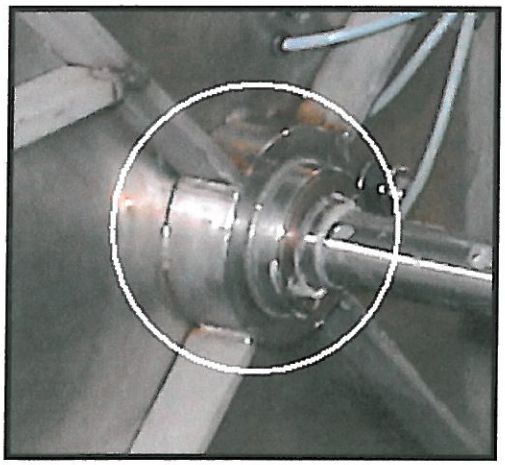


Fig.2

Fig.3

The yoghurt filler has numerous rotating parts, which causes friction. Therefore lubrication is very important. The grease points are shown in the figures above.

Use Spanjaard FMG-X food grade grease and ensure that all grease points are greased properly at least once in three days.

Good treatment of the machine will ensure better performance and longer life span.

11.3. Pneumatics Service Unit:

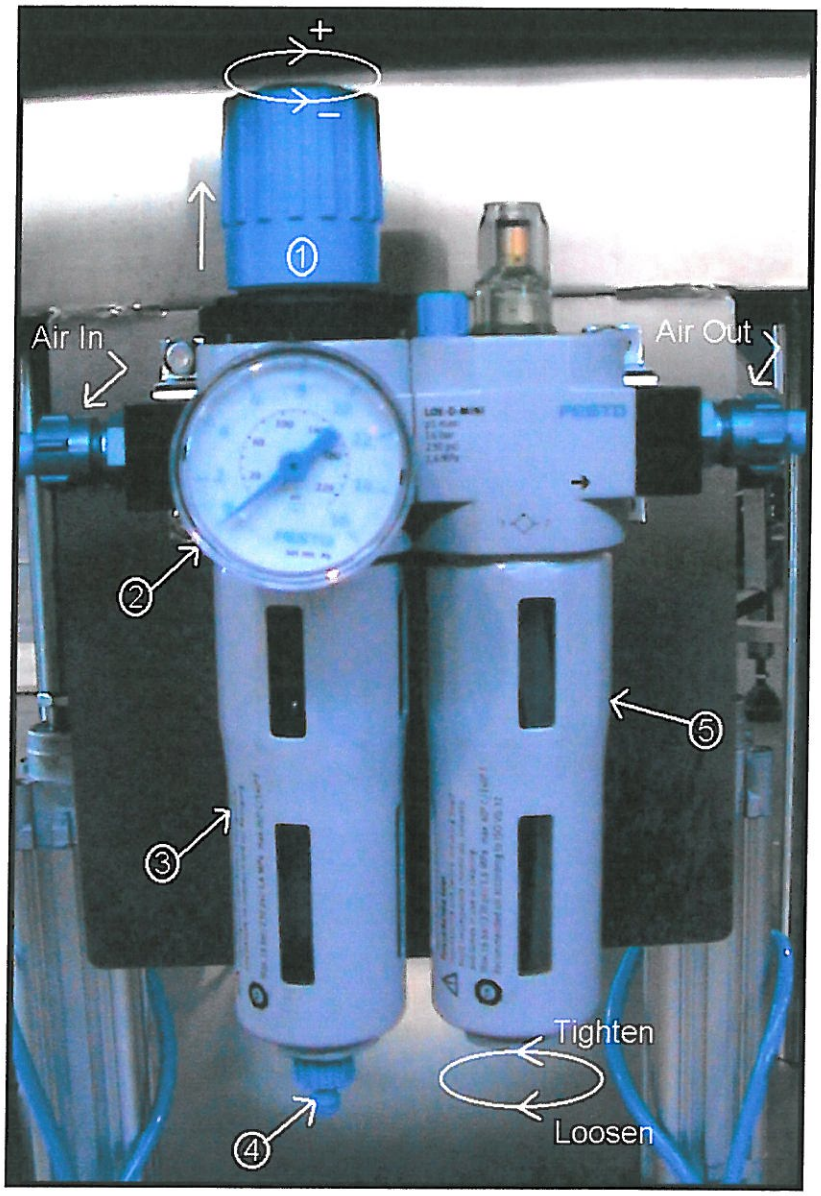


Fig. 16

POS	QTY	DESCRIPTION	PART NO
1	1	FLOW CONTROL AIR	N/A
2	1	GAUGE PRESSURE	N/A
3	1	COMPRESSED AIR WATER TRAP	N/A
4	1	WATER TRAP RELEASE VALVE	N/A
5	1	OIL LUBRICATING UNIT	N/A

The service unit is necessary for regulating, filtering and lubricating the air that operates pneumatic cylinders. Lift the control valve knob as shown in figure.16 (No: 1). The knob can either be turned clockwise, to reduce the pressure, or anti-clockwise to increase the pressure. The air pressure should be set at about 500Kpa.

The water trap should be regularly drained from excess water. Pushing the release valve in an upward direction will cause it open and the compressed air inside will force the water out of the system.

The air that is passed through the oil lubricator contains particles of oil that are necessary for lubricating the pneumatic cylinders. It is of great importance that the oil level is checked regularly. Failure to do so could result in damage to pneumatics components, due to excessive friction. When the oil lubricator is filled, the reservoir must be unscrewed. Figure.16 show how the reservoir can be removed.

It is important to use a high quality lubricating oil.

12. Machine Sub-Assembly

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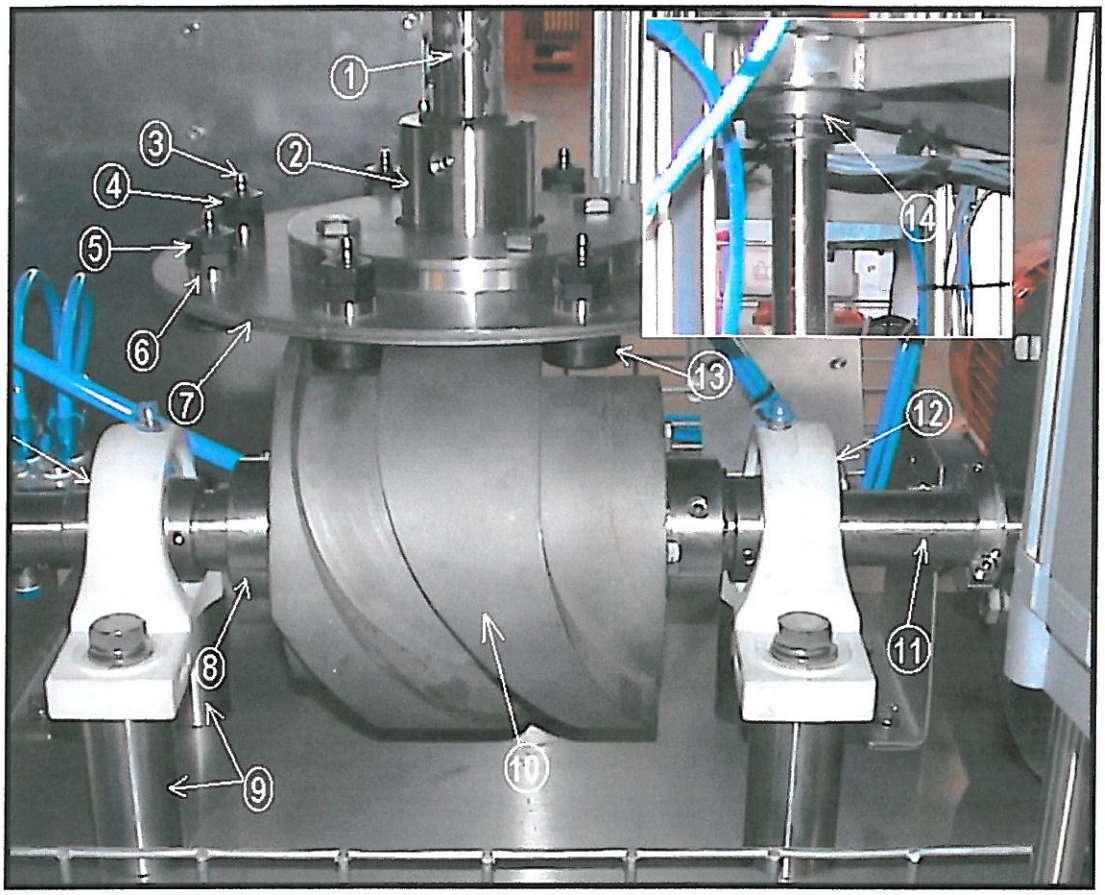
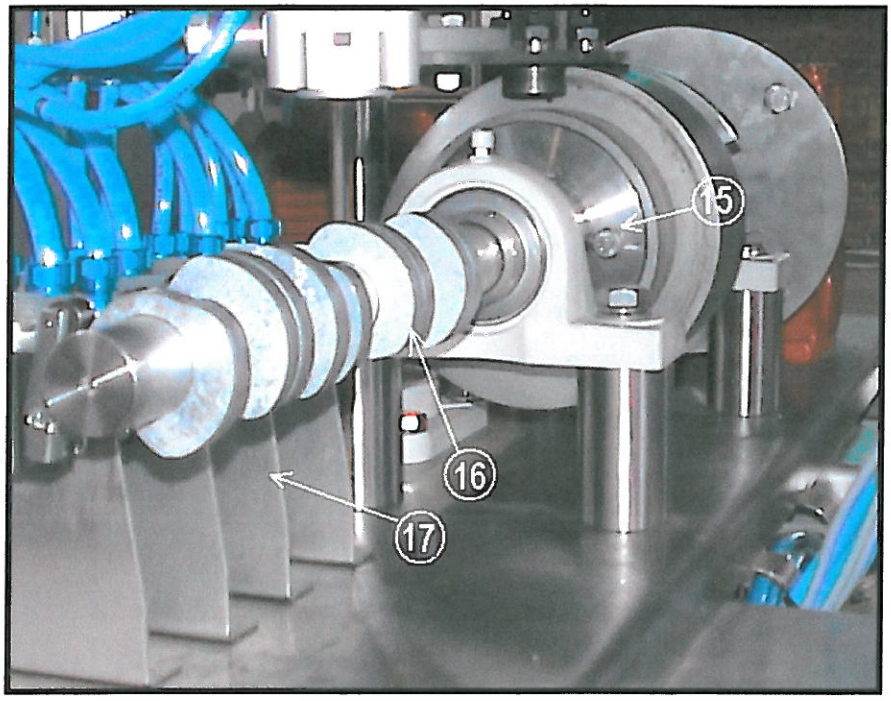
MODEL	TF 1/8/F2/S1	SERIAL NO.:	080705000246	YEAR:	2005
DESCRIPTION: 2-STAGE TUB FILLER					

12.1 Drive:





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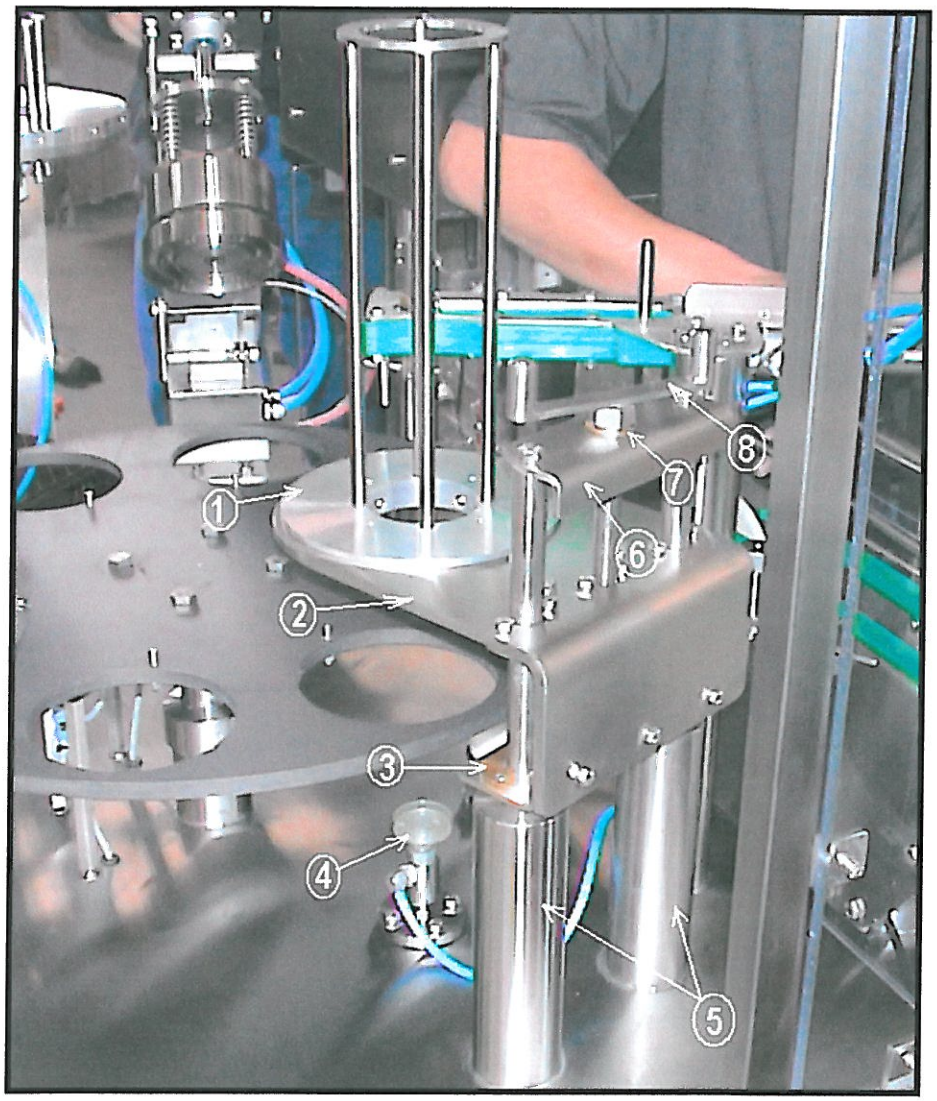
DESCRIPTION:	MACHINE SUB-ASSEMBLY			**PAGE:**	26
MODEL	TF 1/8/F2/S1	**SERIAL NO.:**	080705000246	**YEAR:**	2005
DESCRIPTION: 2-STAGE TUB FILLER					

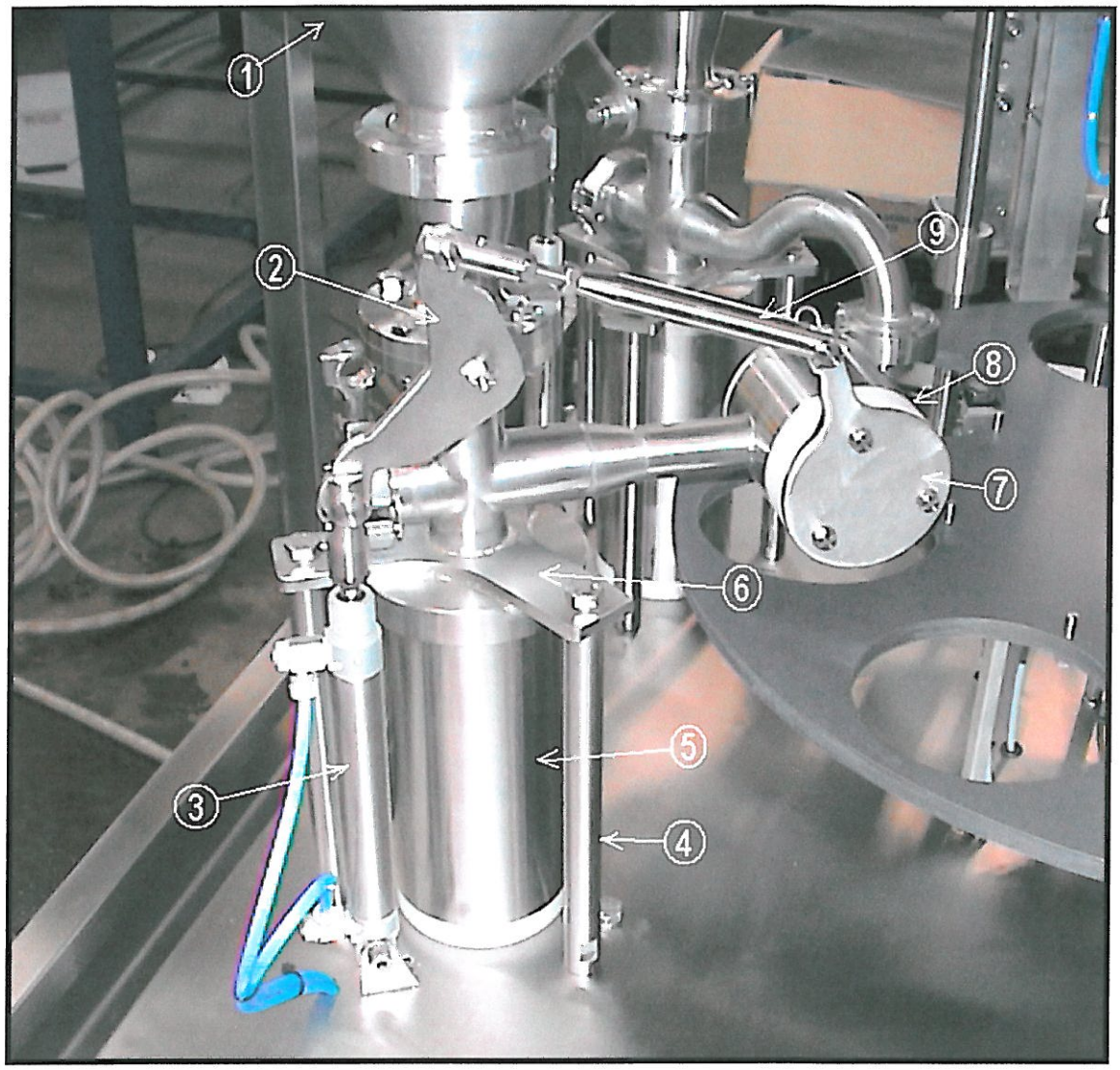
POS	QTY	DESCRIPTION	PART NO
1		DRIVE SHAFT TABLE	915-02-003
2		TABLE BOSS	915-02-009
3		GREASE NIPPLE 3/16	
4			
5			
6		SPACER – CAM FOLLOWERS	915-02-012
7		TIMING PLATE	915-02-008
8		CAM MOUNTING BUSH	915-02-007
9		PILLAR BLOCK MOUNTING SPACERS	915-02-011
10		INDEX CAM	915-02-001
11		DRIVE SHAFT	915-02-004
12		PILLAR BLOCK ∅30	
13		CAM ROLLERS	
14		BUSH STAR WHEEL TOP	610-001-024
15		CAM MOUNTING FLANGE	915-02-006
16		PNEUMATIC CAM	915-02-010
17		VALVE MOUNTING PLATE	915-01-014

12.2 Tub holder station:



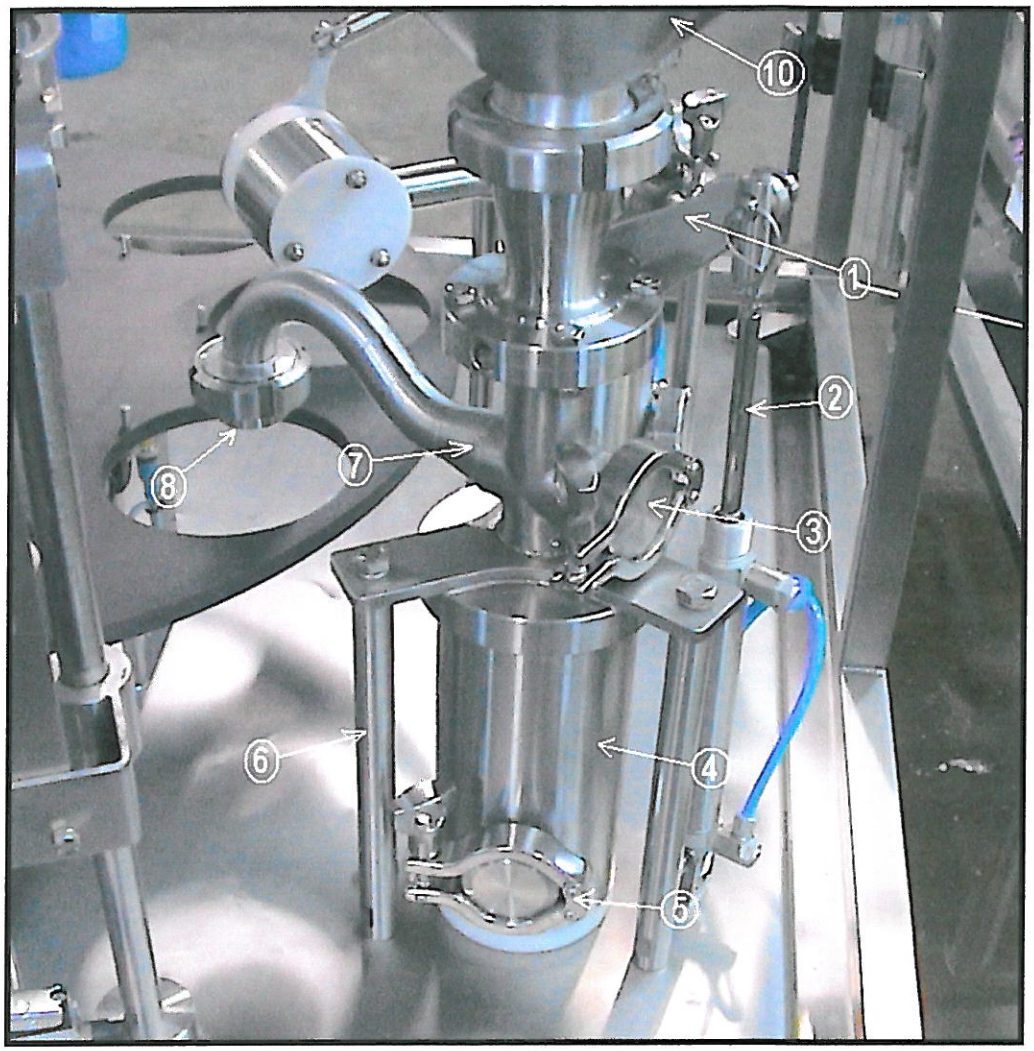
POS	QTY	DESCRIPTION	PART NO
1		CUP HOLDER INSERT ASSEMBLY	
2		GUIDE PLATE	915-03-015
3		SLIDE BUSH	180-00-010
4		VACUUM GENERATOR ASSEMBLY	
5		MOUNTING PILLAR ASSEMBLY	915-03-018
6		JACKING PLATE	915-03-017
7		SPACER-SUPPORT WASHER	300-06-015
8		JACKING HANDLE ASSEMBLY	300-06-020

12.3 Filling station 1:



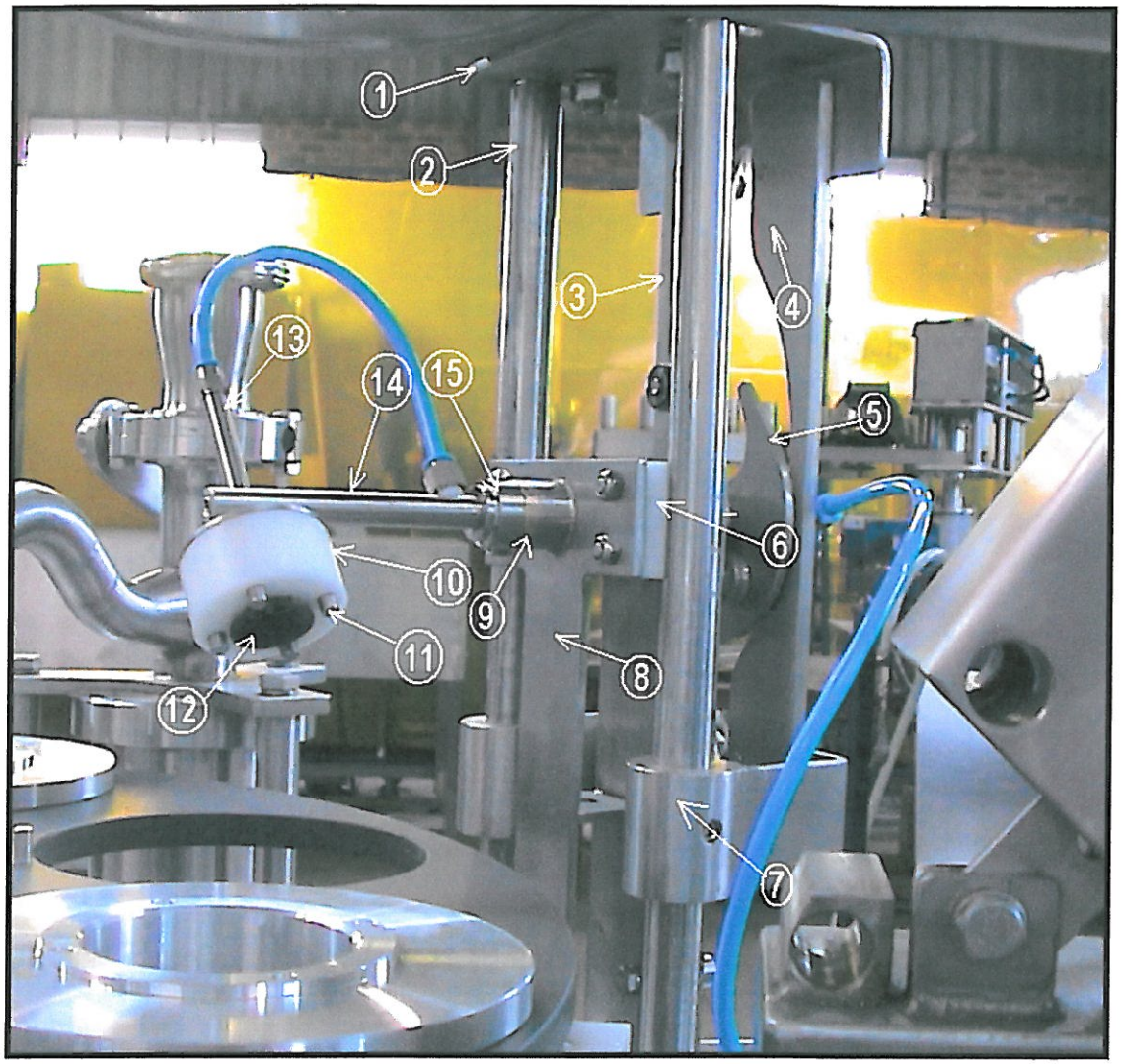
POS	QTY	DESCRIPTION	PART NO
1		HOPPPER TANK ASSEMBLY	915-01-021
2		BUTTERFLY VALVE ARM	915-03-038
3		DSN-25-125-PPVA	
4		PUMP MOUNTING PILLAR	915-03-037
5		PUMP CYLINDER	915-03-031
6		PUMP TAP ASSEMBLY	915-03-025
7		SWITCH ARM	915-03-027
8		VALVE HOUSING	915-03-032
9		SWITCH STRUT	915-03-034

12.4 Filling station 2:



POS	QTY	DESCRIPTION	PART NO
1		BUTTERFLY VALVE ARM	915-03-038
2		DSN-25-125-PPVA	
3		END CAP	915-03-036
4		PUMP CYLINDER	915-03-031
5		TRICLOVER CLAMP	
6		PUMP MOUNTING PILLAR	915-03-037
7		PUMP TAP ASSEMBLY	
8		CREAM NOZZLE	
10		HOPPER ASSEMBLY	915-01-021

12.5 Foil dispenser:



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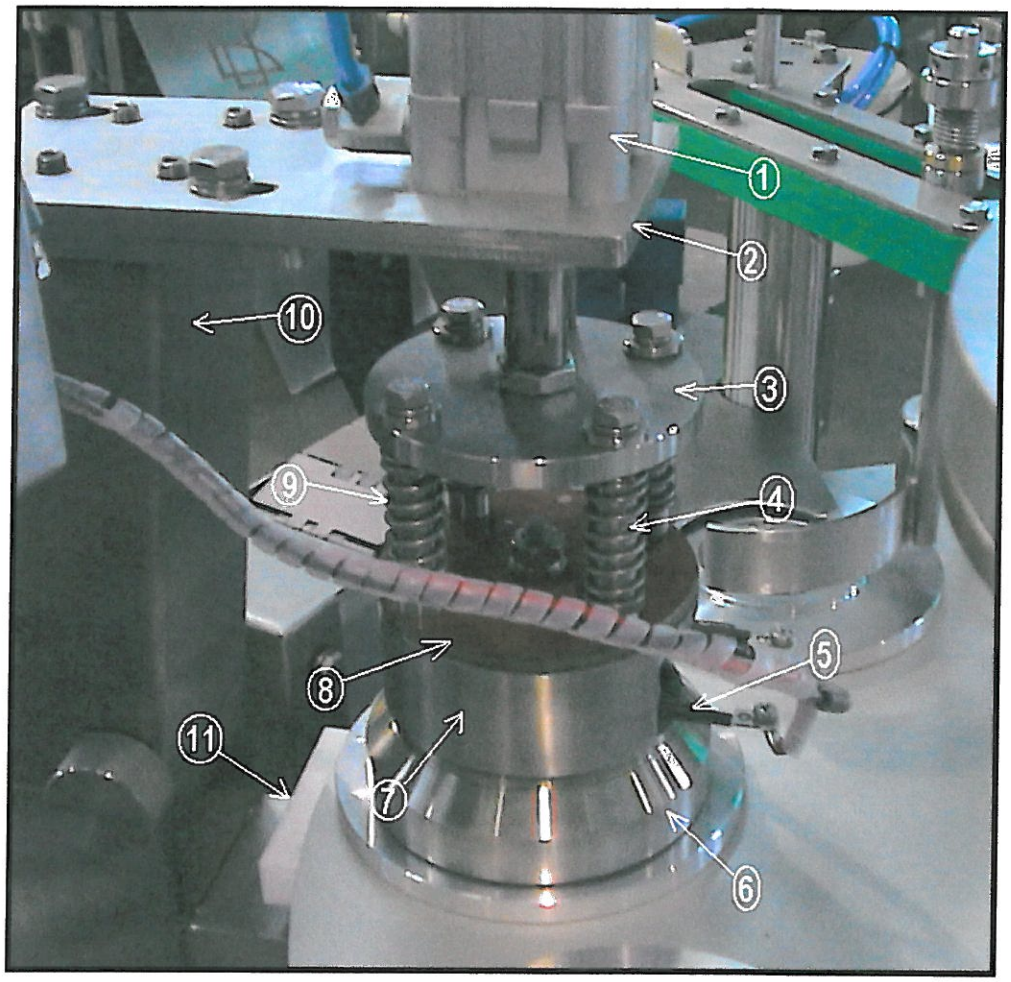
DESCRIPTION:	MACHINE SUB-ASSEMBLY			**PAGE:**	31
MODEL	TF 1/8/F2/S1	**SERIAL NO.:**	080705000246	**YEAR:**	2005
DESCRIPTION: 2-STAGE TUB FILLER					

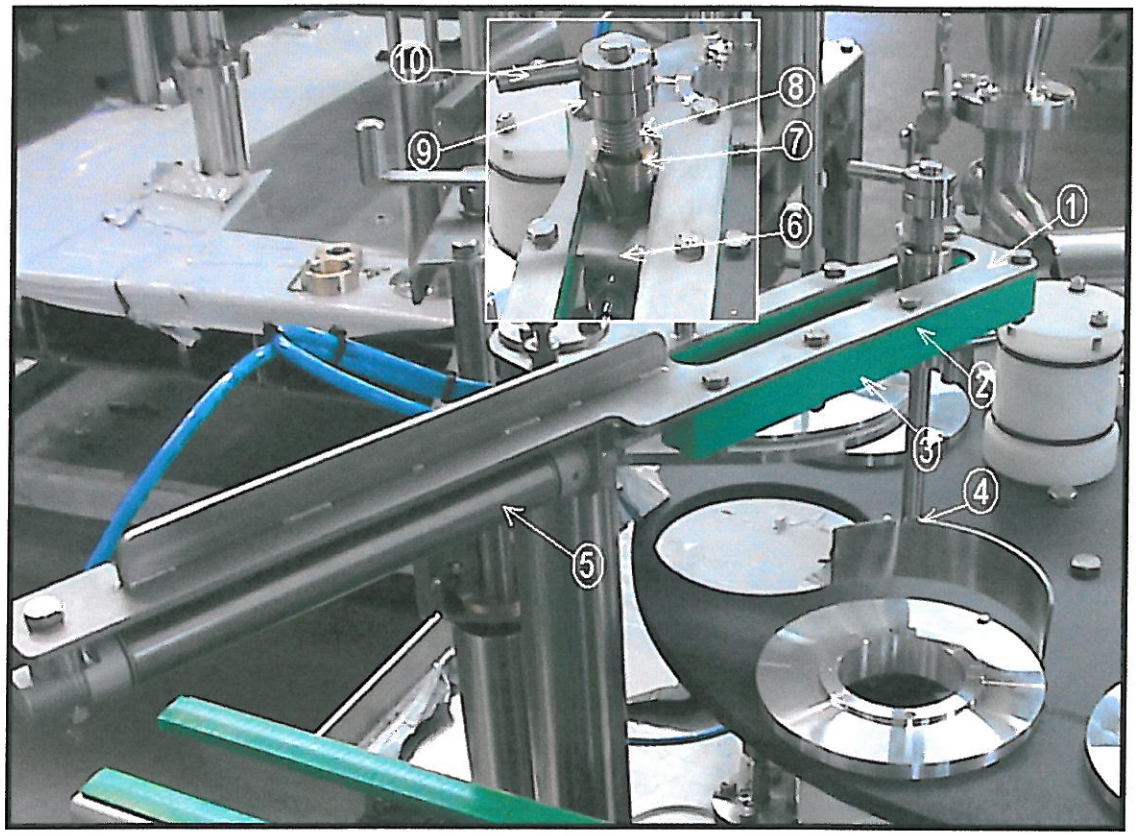
POS	QTY	DESCRIPTION	PART NO
1		TOP MOUNTING RACK	915-05-006
2		PILLAR	915-05-002
3		RIGHT TRACK	915-05-008
4		LEFT TRACK	915-05-007
5		LID DISPENSER CAM	915-05-017
6		SLIDE BUSH	915-05-018
7			
8		LIFTER MECHANISM	915-05-010
9		BRASS BUSH	505-01-013
10		LID PLACER	915-05-045
11		LID PLACER SHAFTS	915-05-046
12		F25 SUCTION CUP	
13			
14		PNEUMATICS SHAFT	
15		SHAFT LOCKING BUSH	915-05-016

12.6 Sealing Station:



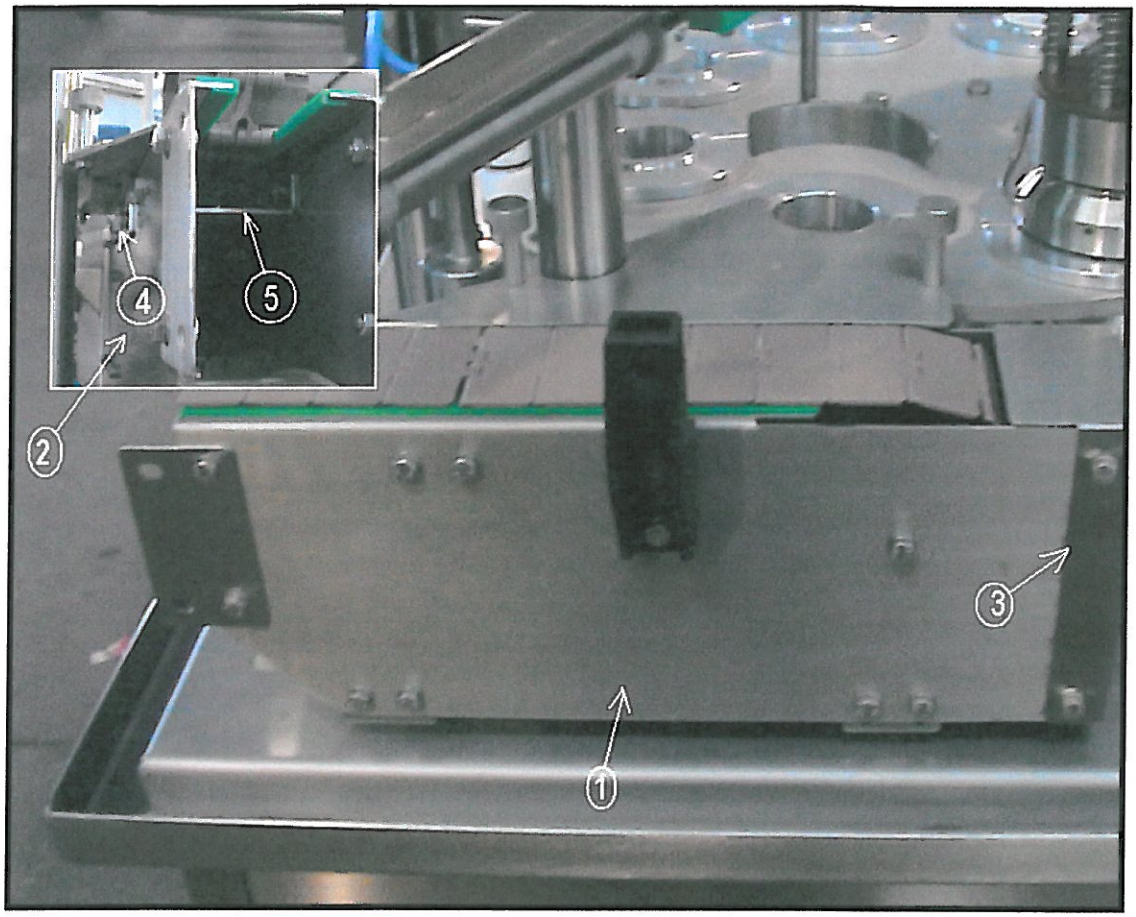
POS	QTY	DESCRIPTION	PART NO
1		DNC 50-40-PPVA	
2		CYLINDER MOUNTING PLATE	915-04-014
3		CONNECTING PLATE	915-04-015
4		SPRING PILLAR	915-04-006
5		ELEMENT 400W	
6		FOIL SEALER	915-04-013
7		SEAL IRON	915-04-025
8		ISLATING PLATE	915-04-026
9		SPRING	915-04-003
10		SEALING POST ASSEMBLY	915-04-001
11		SEALING RE-INFORCEMENT BLOCK	915-04-030

12.7 Discharge Station:



POS	QTY	DESCRIPTION	PART NO
1		TOP PLATE	915-05-032
2		SLIDER TRACK TOP	915-05-035
3		SLIDER TRACK BOTTOM	915-05-037
4		TUB PUSHER ASSEMBLY	915-05-025
5		DSN-25-160-PPVA	
6		TUB PUSHER SLIDE	915-05-029
7		BUSH TENSION SPROCKET	505-01-013
8		SPRING	915-05-022
9		SPRING TIGHTENER	915-05-021
10		ANTI-ROTATE ASSEMBLY	915-05-024

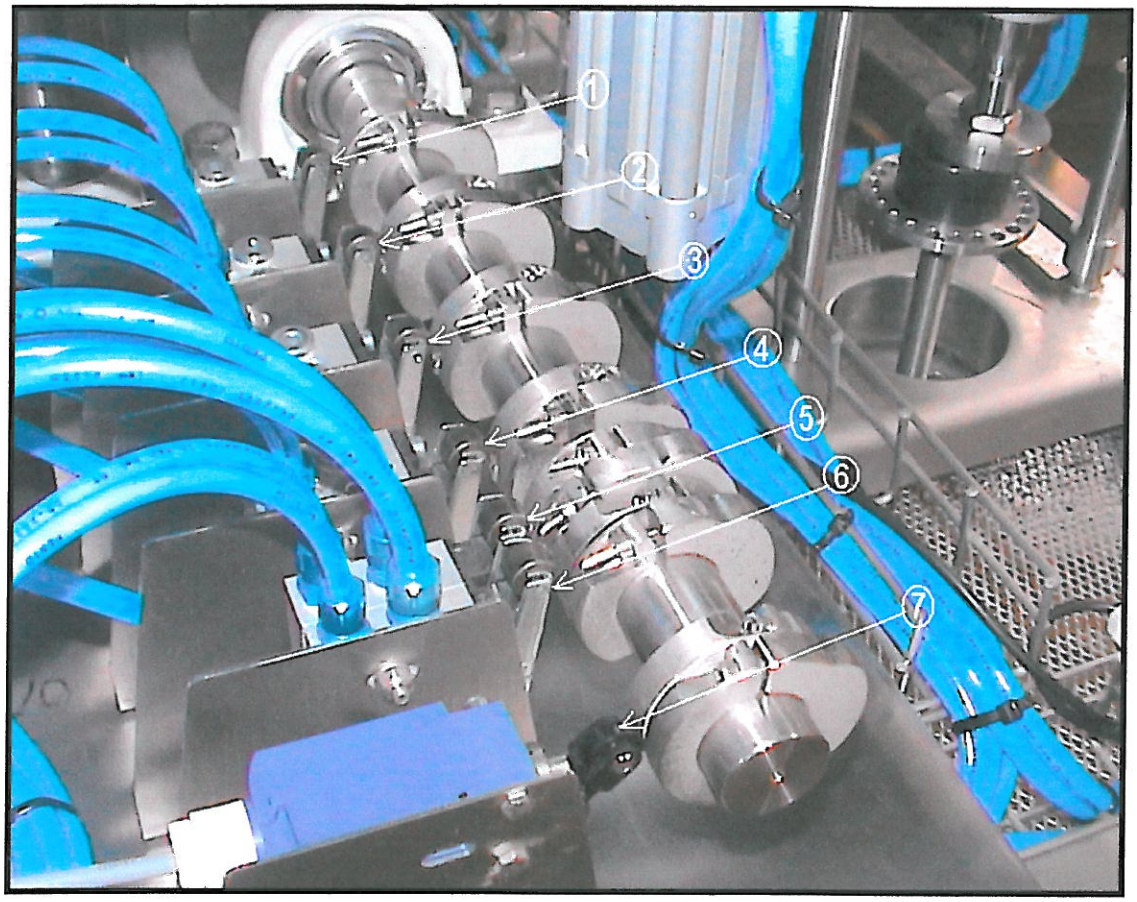
12.8 Discharge conveyor:



POS	QTY	DESCRIPTION	PART NO
1		CONVEYOR OUTSIDE	915-01-008
2		CONVEYOR INSIDE	300-01-009
3		END PLATE	915-01-010
4		DEAD PLATE MOUNTING BRACKET	915-01-006
5		MID SECTION MOUNTING PLATE	610-01-025

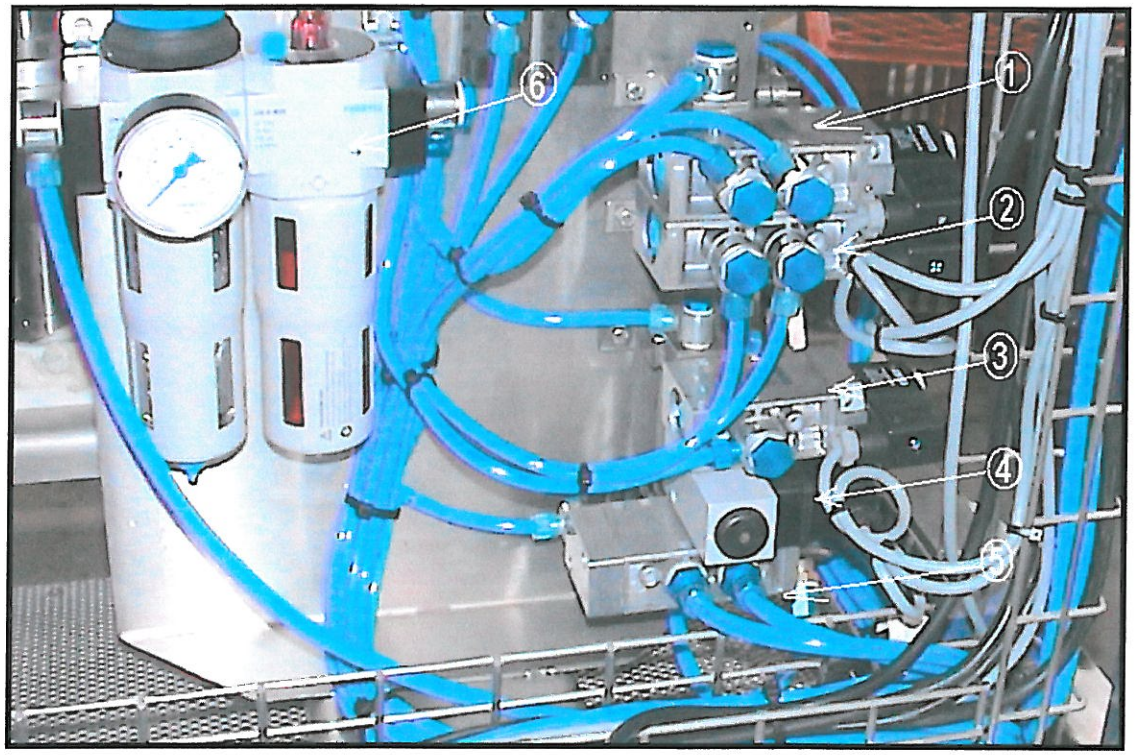
13. Pneumatics:

13.1 Pneumatics cam layout:



POS	QTY	FUNCTION	PART
1		CUP LIFTER	
2		TUB DISPENSER	
3		FOIL DIPENSER & DISCHARGE STTION	
4		SEAL SECTION	
5		VACUUM – TUB DISPENSER	
6		FILLING PUMPS	
7		FILLING VALVES	

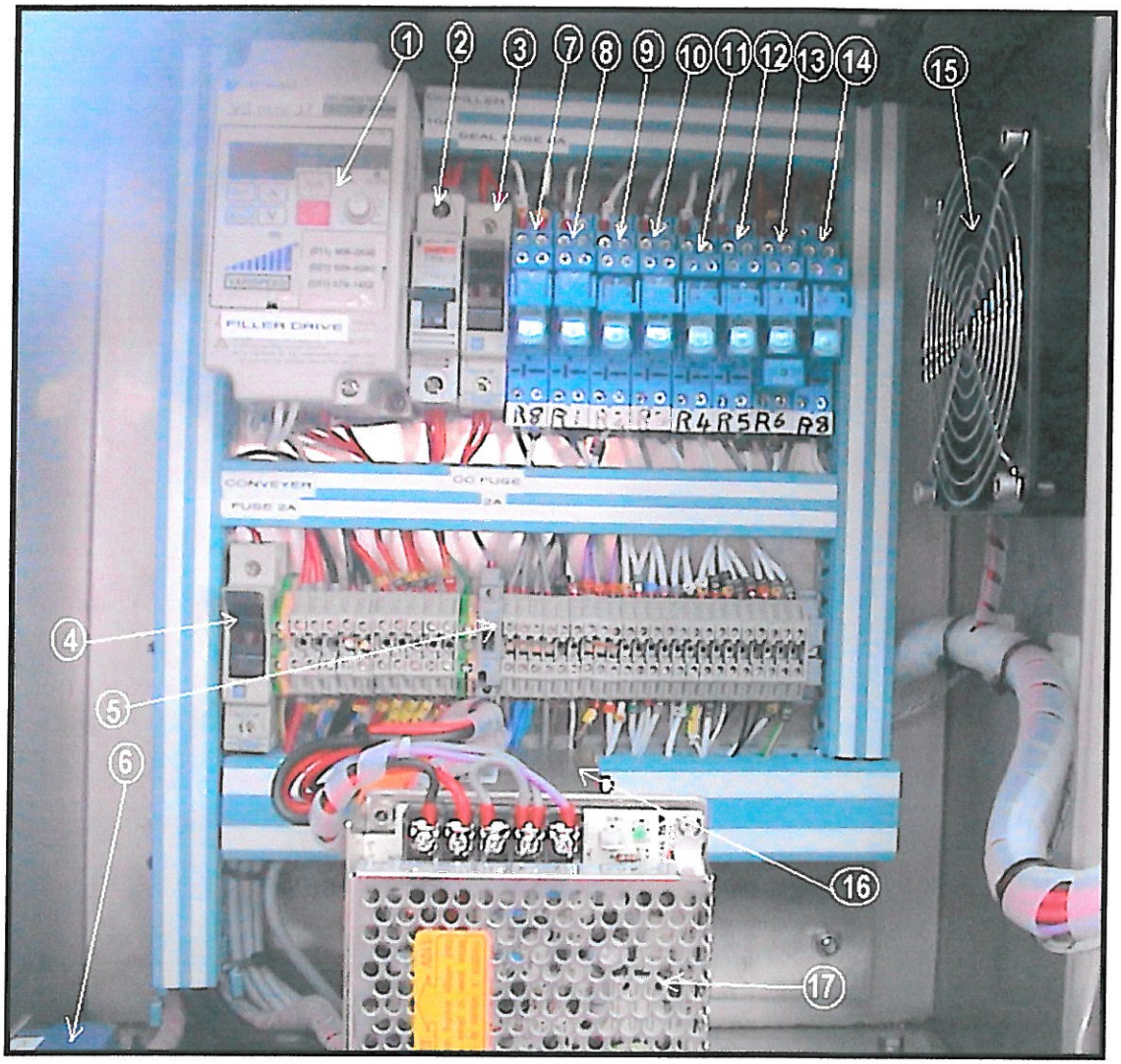
13.2 Pneumatics valves:



POS	QTY	FUNCTION	PART
1		FILLING VALVE 1	
2		FILLING VALVE 2	
3		VACUUM – FOIL DISPENSER	
4		AIR PRESSURE SWITCH	
5		PUMP SOLENOID	
6		SERVICE UNIT	

14. Electronics:

14.1 Electrical cabinet:



Marefa

bottle filling equipment

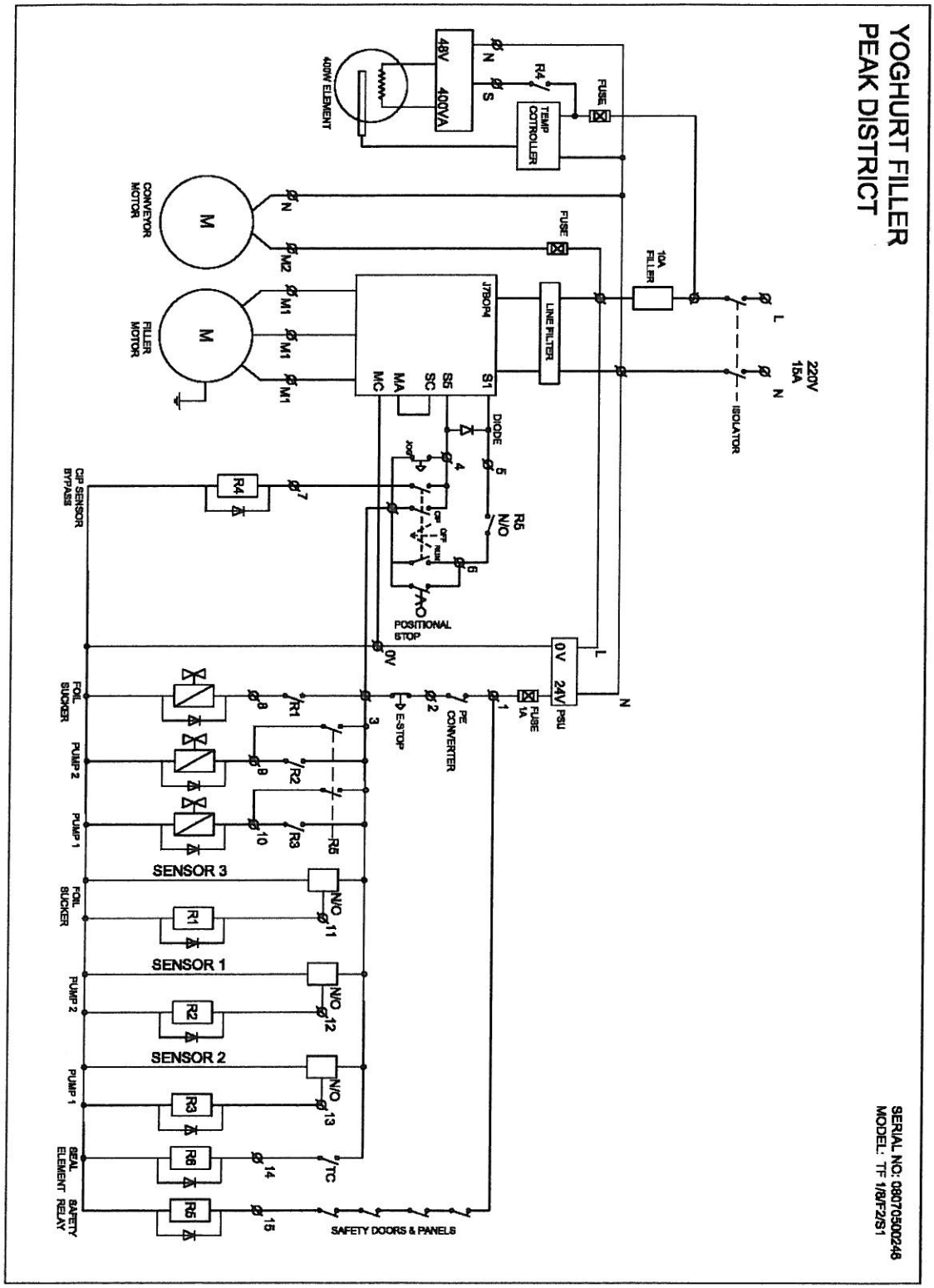
DESCRIPTION:	ELECTRONICS			**PAGE:**	38
MODEL	TF 1/8/F2/S1	**SERIAL NO.:**	080705000246	**YEAR:**	2005
DESCRIPTION: 2-STAGE TUB FILLER					

POS	QTY	FUNCTION	PART
1	1	FILLER DRIVE	YASKAWA J7BOP4
2	1	CC/FILLER	M+G 10A CIRCUIT BREAKER
3	1	SEAL ELEMENT	FUSE 8A M+G
4	1	CONVEYOR	FUSE 2A M+G
5	1	CONTROL CIRCUIT	FUSE 2A WIELAND
6	1	SAFETY DOOR SWITCH	TELEMECHANIQUE
7	1	PUMP 1&2	RELAY 8
8	1	FOIL SUCKER	RELAY 1
9	1	PUMP 2	RELAY 2
10	1	PUMP1	RELAY 3
11	1	CIP SENSOR BY PASS	RELAY 4
12	1	SAFETY RELAY	RELAY 5
13	1	SEAL ELEMENT	RELAY 6
14	1	CONVEYOR	RELAY 7
15	1	EXTRACTOR FAN	EXTRACTOR FAN 220V-AC
16	1	CONTROL CIRCUIT POWER SUPPLY	MEANWELL 220/24V- DC
17	1	SEAL ELEMENT POWER SUPPLY	TRANSFORMER 220/50V 400VA

Marefa
bottle filling equipment

DESCRIPTION:	ELECTRONICS			PAGE:	39
MODEL	TF 1/8/F2/S1	SERIAL NO.:	080705000246	YEAR:	2005
DESCRIPTION: 2-STAGE TUB FILLER					

14.2 Electrical diagram:



10. TROUBLESHOOTING

PROBLEM	SOLUTION
One of stations not functioning:	Check sensors: Sensors might not point at the right spot. There might be an obstruction. Sensor might be damaged and should be replaced.
Process not in time:	Adjust timing by loosening the carrier plate and set it up with the sealing station
Cups not released from holder:	Cup holder to high. Lower to sufficient height
Foil not placed on cups:	Foil sucker might be damaged and should be replaced.
Sealing not proper, or element melting the cup:	Temperature too high or too low, set to correct temperature.

Marefa

bottle filling equipment

DESCRIPTION:	CONTACT DETAILS			**PAGE:**	41
MODEL	TF 1/8/F2/S1	**SERIAL NO.:**	080705000246	**YEAR:**	2005
DESCRIPTION: 2-STAGE TUB FILLER					

If you encounter any problems or have any questions, contact us at:

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